SECTION 6.0

Alternatives

6.1 Introduction

The California Environmental Quality Act (CEQA) requires consideration of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" [14 CCR. 15126.6(a)]. Thus, the focus of an alternatives analysis should be on alternatives that "could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects" [14 CCR 15126.6(c)]. The CEQA Guidelines further provide that "[a]mong the factors that may be used to eliminate alternatives from detailed consideration in an Environmental Impact Report (EIR) are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts" [14 CCR 15126.6(c)].

The National Environmental Policy Act (NEPA) also requires the identification and analysis of a reasonable range of alternatives. NEPA's requirements for an alternatives analysis are found in the White House Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR 1502.14). CEQ guidance states that "[r]easonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant" (CEQ Forty Most Asked Questions, Question 2a, 46 Fed. Reg. at 18,029). NEPA requires an Environmental Impact Statement (EIS) to rigorously explore and objectively evaluate all reasonable alternatives that meet the purpose and need of the proposed action, including those that are not within the jurisdiction of the lead agency. NEPA also requires a brief explanation of the reasons for eliminating an alternative from detailed study.

The Bureau of Land Management (BLM) will be the lead federal agency for NEPA compliance for the Ivanpah Solar Electric Generating System (Ivanpah SEGS) project. The Federal Land Policy and Management Act (FLPMA) identifies the responsibilities of BLM in preparing NEPA documents. As identified in Section 1765 of the FLPMA, BLM's responsibility in granting a right of way (ROW) is to "minimize damage to scenic and esthetic values and fish and wildlife habitat and otherwise protect the environment…require compliance with State standards for public health and safety, environmental protection, and siting, construction, operation, and maintenance of [ROWs]" and "require location of the [ROW] along a route that will cause least damage to the environment, taking into consideration feasibility and other relevant factors." Thus, BLM's role to ensure compliance with state standards includes conformance with Senate Bill (SB) 1078 (California Renewable Portfolio Standard Program) and Assembly Bill (AB) 32 (California Global Warming Solutions Act of 2006).

A range of reasonable alternatives that could feasibly attain most of the basic objectives of the Ivanpah SEGS are identified and evaluated in this section including a conservation

alternative, a smaller plant alternative, the "No Project" alternative (that is, not developing a new solar power generation facility), alternative site locations for constructing and operating Ivanpah SEGS, alternative thermal configurations to the solar arrangement proposed for Ivanpah SEGS, and alternative power generation technologies. Alternatives to the linear facilities (electric, natural gas, and water) were not considered because the distances are relatively short and direct; therefore, alternative routes would not avoid or substantially reduce environmental impacts compared to the project.

6.1.1 Project Objectives

The Applicant will enter into a ROW agreement with BLM for the use of the land at the proposed site. This location was selected to meet the basic objectives of the project, including, but not limited to the following:

- To safely and economically construct and operate a nominal 400-megawatt (MW), solar generating facility in California capable of selling competitively priced renewable energy consistent with the needs of California utilities. To demonstrate the technical and economic viability of Bright Source's proprietary Distributed Power Tower technology in a commercial-scale project.
- To locate the facility in areas of high solarity with ground slope of less than 5 percent.
- To minimize infrastructure needs and reduce environmental impacts by locating the plant near existing and planned infrastructure, including: California Independent System Operator (CAISO) transmission lines, a source of natural gas, and an adequate water supply.
- To avoid siting the plant in areas that are highly pristine or biologically sensitive (e.g., a Desert Wildlife Management Area [DWMA]).
- To locate the project consistent with existing land use plans. If on public land, to comply with the multiple use objectives of FLPMA, which includes renewable energy development, and the objectives of the California Desert Conservation Area (CDCA) Resource Management Plan (RMP), which allows for solar energy development in some areas including the proposed project area.
- To assist California in repositioning its generation asset portfolio to use more renewable energy in conformance with state policy, including the policy objectives set forth in SB 1078 (California Renewable Portfolio Standard Program) and AB 32 (California Global Warming Solutions Act of 2006).
- To comply with provisions of the power sales agreement in negotiation for the first projects, to develop a project that can interconnect to a CAISO transmission line with the potential of achieving a commercial on-line date in 2010, but no later than 2011.

6.1.2 Alternative Site Selection Criteria

The following criteria were developed to evaluate the alternative sites' suitability for solar power tower development:

- **Site Suitability (Solarity, Size and Grade)—** The site needs to be located in an area with long hours of sunlight (low cloudiness). It needs to be at least 5 square miles of contiguous land and it needs to be relatively flat, with a grade of 5 percent or less.
- **Site Control—** The land has to be available for sale or use (e.g., lease or ROW). If private land, the land owner must be willing to negotiate a long-term option agreement so that site control does not require a large capital investment until the license is obtained.
- **Proximity to Infrastructure—** The site needs to be located in close proximity to high voltage CAISO transmission lines with adequate capacity, a gas transmission system, and have an adequate water supply.
- **Environmental Sensitivity—** The site should have few or no environmentally sensitive areas and should allow development with minimal environmental impacts.
- **Jurisdictional Issues—** The proposed use should be consistent with the existing jurisdictional policies. It should provide opportunity for compliance with all laws, ordinances, regulations, and standards (LORS).
- **Economic Viability—** The project needs to be economically viable and competitive with other renewable technologies including wind, geothermal, and solar. The site should be located on property currently available at a reasonable cost, have reasonable proximity to infrastructure and have good solarity. Sites with excellent solarity may be able to carry higher mitigation costs or infrastructure costs.

The Applicant had several meetings with the California Energy Commission (CEC) and BLM and has performed a substantial analysis to identify appropriate locations. The alternative site locations, shown in Figure 6.1-1 (located at the end of this section), were evaluated using the above criteria.

6.2 Alternatives Considered

This section describes the Ivanpah SEGS site and the 10 alternative site locations that were considered for a 400-MW solar project. A discussion is also provided of the No Project and Conservation Alternatives. Of the 10 alternative sites considered, six locations were not carried forward for further analysis, and four locations were carried forward for full examination. Table 6.2-1 lists the alternatives considered.

TABLE 6.2-1
Alternatives Considered

Locations not Carried Forward for Further Analysis	Locations Carried Forward for Further Analysis
Carrizo Plain	Ivanpah SEGS
Harper Lake	Ivanpah Site A
Lucerne Valley	Ivanpah Site C
Rabbit Lake	Broadwell Lake
Jean Lake	Siberia
Ivanpah Site B	No Project/Conservation

6.2.1 Alternative Site Locations Considered But Not Carried Forward

Six locations were considered but not carried forward for further analysis. They are:

- Carrizo Plain
- Harper Lake
- Lucerne Valley
- Rabbit Lake
- Jean Lake
- Ivanpah Site B

These six potential alternative project sites were not carried forward for detailed analysis because they were not considered feasible; it is unlikely they would avoid or substantially reduce environmental impacts compared to the project location, and they fail to satisfy most of the project's basic objectives for reasons summarized in the following subsections.

6.2.1.1 Alternative Sites Are Not Feasible

A summary of the site selection criteria and reasons for elimination from further consideration are presented below and summarized in Table 6.2-2.

6.2.1.1.1 Site Suitability (Solarity, Size and Grade)

One of the objectives is for the site to have at least 5 square miles (3,200 acres) of relatively flat slope (less than a 5 percent grade) with high solarity. All of these sites had adequate solarity except Carrizo Plain. It is unclear whether adequate land area is available at Jean Lake due to prior ROW applications and land reservations for utility corridors.

6.2.1.1.2 Ability to Obtain Site Control

Harper Lake, Lucerne Valley, and Rabbit Lake did not have sufficient contiguous land. Obtaining site control for 3,200 acres was determined to be infeasible at Harper Lake, Lucerne Lake, and Rabbit Lake because putting together several option agreements with different private owners is time consuming and risky. Obtaining site control appears possible at Carrizo Plain because there are large parcels for sale, and landowners might wish to sell; however, obtaining option agreements for 3,200 contiguous acres would still be difficult. Jean Lake and Ivanpah Site B were eliminated because there is a preexisting claim that has been filed with BLM by other developers for those land areas.

TABLE 6.2-2
Comparison of Site Screening Criteria for Eliminated Sites

	Site Suitability	Site Control	Infrastructure			Environmental Sensitivity	Jurisdiction	Economic Viability
			Electrical	Gas	Water			
Carrizo Plain	**Poor solarity**	Medium	Excellent	Poor	Poor	Good	Excellent	Poor
Harper Lake	**Excellent solarity; size too small**	**Poor—one major owner wanted too much money**	**Insufficient capacity until 2013 or later**	Good	Good	Good	Excellent	Good
Lucerne Lake	**Size too small**	Poor—too many owners	**Insufficient capacity until 2013 or later**	Good	Medium, adjudicated basin	Medium	Excellent	Poor
Rabbit Lake	**Size too small**	Poor—too many owners	**Insufficient capacity until 2013 or later**	Good	Medium, adjudicated basin	Medium	Excellent	Poor
Jean Lake	Good solarity; unknown size	**Site reserved by others**	Good	Medium	Uncertain	Medium	**Poor**	Good
Ivanpah Site B	Good solarity; adequate size	**Site reserved by others**	Good	Excellent	Excellent	Medium	Excellent	Good

Note: Primary factors for elimination are shown in **bold**.

6.2.1.1.3 Lack of Available Infrastructure

To be suitable for further consideration, sites need to offer proximity to the CAISO electrical lines that have additional capacity or can be upgraded quickly. In addition, sites need to be near natural gas lines and have access to water.

Transmission

In the eastern Mojave Desert in California, there are three transmission corridors. The northern transmission lines of Southern California Edison (SCE) and the Los Angeles Department of Water and Power (LADWP) run north of Interstate 15 (I-15). However, only the SCE 115-kilovolt (kV) line is a CAISO line, which is a project requirement. The Ivanpah SEGS site and Ivanpah Site B are located in this corridor, as is Jean Lake.

The middle corridor of SCE lines running from the Pisgah substation near Interstate 40 (I-40) to southern Nevada. Around the Pisgah substation there are several projects that would generate thousands of megawatts of electricity that are seeking interconnection; and it is expected that any transmission solution will require collaboration among many parties and take a very long time. It is not, therefore, a candidate for a site requiring a commercial on-line date (under its Power Purchase Agreement) of no later than 2011.

The southern corridor runs north of I-40. Broadwell Lake and Siberia lie in this corridor. The large number of projects seeking interconnection at the Mojave power plant and ahead in the queue for this transmission corridor also means that transmission access cannot be expected before 2013-14, which does not meet the goal of having renewable power on-line by 2010-2011.

Natural Gas

Proximity to natural gas is a requirement because the proposed project requires natural gas during periods of intermittent solarity (i.e., when clouds block the sunlight). The Carrizo Plain area was determined to be too far from an adequate gas supply. Gas availability was considered good at Harper Lake, Lucerne Lake, and Rabbit Lake; medium at Jean Lake; and excellent at Ivanpah Site B.

Water Supply

Proximity to, and adequate supply of, water of sufficient quality is also considered necessary. The availability of a sufficient water supply was determined to be poor at Carrizo Plain; good at Harper Lake; adequate at Lucerne Lake and Rabbit Lake because the water basin has been adjudicated and these sites lie in a less costly part of the basin for water use; and excellent at Ivanpah Site B. Adequacy of water at Jean Lake was uncertain.

6.2.1.1.4 Environmental Sensitivity

Much of the eastern Mojave Desert is federal land managed by BLM under the multiple use objectives of the FLPMA and the CDCA RMP. Considerable land is already set aside for other uses: national parks, wilderness study areas, areas of critical environmental concern, DWMAs, and areas for off-road vehicle use. In addition, there are military flight paths in the desert where towers are discouraged. The Applicant conferred with BLM realty officers to identify and avoid these areas and also conferred with the Department of Defense and representatives of the military installations. Many potential BLM sites were found unsuitable for these reasons or because of high mitigation requirements for desert tortoise

habitat. The environmental sensitivity was determined to be good at Carrizo Plain and Harper Lake; medium at Lucerne Lake, Rabbit Lake, Jean Lake and Ivanpah Site B.

6.2.1.1.5 Jurisdictional Issues

Two jurisdictional issues affected site selection. First, the project needs to be interconnected to CAISO lines to meet the requirements of the power sales agreement. Second, since the intent is to provide all of the power production to California utilities to meet California's ambitious Renewable Portfolio Standard goals, the Applicant was advised that siting a plant in Nevada or Arizona with the intent of exporting 100 percent of its output to California was unlikely to be successful—the permitting process would be contentious and slow. Given the rapid timing required by the Power Purchase Agreement, a contentious permitting process was not in keeping with the project goals. For these reasons, Jean Lake was eliminated.

6.2.1.1.6 Economic Viability

To be economically viable a project must be sited close to existing infrastructure (natural gas and electric lines), have modest land cost (including consideration of grading cost), modest water cost, modest mitigation requirements, and good solarity. A site with excellent solarity might be able to afford higher land cost or longer lines for interconnection, but there is little leeway since solar projects compete with wind, geothermal, and other renewable technologies in utility solicitations. The overall economic viability was considered poor for Carrizo Plain, Lucerne Lake, and Rabbit Lake; medium for Harper Lake; and good for Jean Lake and Ivanpah Site B.

6.2.1.2 Alternative Sites Would Not Avoid or Substantially Reduce Environmental Impacts

All six sites are located in desert areas, and would require about 5 square miles of land area and linear corridors of varying lengths. Two sites, Harper Lake and Carrizo Plain are expected to have less environmental sensitivity than the Ivanpah SEGS site, in part because they are on private land that has been graded or farmed. However, these two sites were not viable for several reasons as discussed above. The remaining sites are expected to have environmental sensitivity similar to the Ivanpah SEGS site.

6.2.1.3 Alternative Sites Would Fail to Satisfy Project Objectives

The first screening criteria (Site Suitability) addresses two of the project objectives: to construct a 400-MW solar site and to locate it in an area of high solarity with ground slopes of 5 percent or less. Carrizo Plain, Harper Lake, Lucerne Lake, and Rabbit Lake fail to meet these project objectives.

The third screening criteria (Proximity to Infrastructure) is also a project objective. Carrizo Plain is far from gas transmission lines and lacks adequate water supply so that site fails to meet this project objective. At Jean Lake, the availability of groundwater is uncertain.

Other project objectives include avoiding siting the plant is areas that are highly pristine or biologically sensitive and locating the project consistent with existing land use plans, the FLPMA, and CDCA RMP. All of the six sites considered would be consistent with these project objectives.

The final project objective is to develop a project with the potential of achieving a commercial on-line date of 2010 to 2011. Three project sites—Harper Lake, Lucerne Lake

and Rabbit Lake—have constrained transmission capacity and system upgrades would not likely be available until 2013 or later.

Two of the six sites above that meet most of the project objectives are Jean Lake and Ivanpah Site B. However, those potential locations are unavailable because they have been reserved by other developers, and, therefore, were not considered further.

6.2.2 Alternatives Carried Forward for Further Analysis

6.2.2.1 Ivanpah SEGS Site

Ivanpah SEGS will be located in southern California's Mojave Desert, near the California–Nevada border, to the west of Ivanpah Dry Lake. The project will be located in San Bernardino County, California, on federal land managed by BLM.

Ivanpah SEGS will be interconnected to the SCE grid through updates to SCE's 115-kV line passing through the site on a northeast-southwest right-of-way. These updates will include the construction by SCE of a new 220/115-kV breaker-and-a-half substation between the Ivanpah 1 and 2 project sites. This new substation and system upgrades will be for the benefit of Ivanpah and other Interconnection Customers in region. The existing 115-kV transmission line from the El Dorado substation will be replaced with a double-circuit 220-kV overhead line that will interconnect to the new substation. Power from Ivanpah 1, 2 and 3 will be transmitted at 115 kV to the new substation. Depending on the timing and development of wind projects ahead in the queue, SCE may add three new 115-kV lines to increase capacity to the existing El Dorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115-kV line heading southwest.

6.2.2.2 Ivanpah Site A

A potential alternative site for a 400-MW project lies to the southwest of the Ivanpah SEGS site stretching from northwest to southeast across sections 31, 32, and 33 (T17N, R14E) and sections 3, 4, 5, 8, 9, 10, 11,14, 15, 16, 21, 22, and 23 (T16N, R14E) (Figure 1.3-1). Ivanpah Site A overlaps with the Ivanpah SEGS site in portions of sections 33, 3, 11 and 12, an overlap of a little more than 1 square mile in total. Section 16 is state land rather than BLM land.

Ivanpah Site A (Site A) has similar characteristics to the Ivanpah SEGS site in that interconnection timing would be comparable, environmental resources would be expected to be comparable, and it is equally distant from the dry lake. It is slightly farther from the Primm Valley Golf Club (the nearest public facility) at its closest point. However, Site A has the following disadvantages compared to the Ivanpah SEGS site:

- The site is much closer to the I-15 with no buffer zone
- The southern portion of the site could conflict with a future agricultural inspection station
- Section 16 is state-owned land, which further complicates the land leasing and permitting process
- Because it is farther south, longer interconnections with the Kern River Gas Transmission (KRGT) Line would be required

- The site is closer to the Clark Mountains so the grade is somewhat greater, requiring greater grading with more impact on the land
- The site is closer to the DWMA, which is on the south side of I-15.

6.2.2.3 Ivanpah Site C

Ivanpah Site C (Site C) lies to the southeast of the Ivanpah SEGS site between I-15 (on the north) and Nipton Road (Highway 164) on the south. It has similar characteristics to the Ivanpah SEGS site in that interconnection timing would be comparable and the land has a slope of 5 percent or less. However, Site C has the following disadvantages compared to the Ivanpah SEGS site:

- The interconnections to the KRGT and SCE lines would be longer and would require crossing I-15.
- The site would be constrained between I-15, Highway 164, and Ivanpah Dry Lake ,and offers little flexibility for layout revisions.
- The site is much closer to the dry lake where cultural artifacts are more likely to be found and where biological resources may be more varied.
- The site is located in a DWMA.
- Flooding could be problematic given the proximity to the dry lake.
- The site is visible from two roads, not just one.

6.2.2.4 Broadwell Lake

Broadwell Dry Lake is about 7 to 8 miles northeast of SCE's Pisgah substation and due north of I-40 at Crucero Road. The existing 220-kV SCE lines are within 1 to 2 miles of the site, and the 500-kV lines are within 6 to 7 miles to the south. However, major upgrades with multiple parties are required. The Applicant has filed an interconnection request for this site and a SF 299 ROW application with the BLM. Broadwell Lake is considered a good site for later development. There is adequate land for generation of several hundred megawatts in this area. This is a competitive area for natural gas service with major transmission from Pacific Gas and Electricity (PG&E), Mojave, and Southern California Gas (SoCalGas) all within 10 miles. PG&E's lines 300A and B are 3 miles south of I-40. The SoCalGas line is closer to the site, running north of I-40 and joining PG&E's lines at Pisgah Crater Road. The site is outside of the Mojave Water Agency territory and is not served by any company. Little is known about the basin, so it is not known whether the minimum level of water would be available.

6.2.2.5 Siberia

This area is located about 10 miles south of Broadwell Dry Lake, south of National Trails Highway (Historic Route 66) between the communities of Siberia and Bagdad. The existing SCE 500-kV lines are about 15 miles to the north, and major system upgrades with multiple parties are required. The Pisgah substation is 25 to 30 miles away. The area is too small for a contiguous 400-MW site, but two 200-MW plants could be located in this vicinity, about 3 miles apart. PG&E's major gas transmission lines 300A and B bisect these two sites. The site

is outside of the Mojave Water Agency territory and is not served by any company. Water is known in the area but the quantities that might be available are unknown.

6.2.2.6 No Project Alternative and Conservation Alternative

Ivanpah SEGS will produce renewable electricity for California, thus supporting the goals of SB 1078 and AB 32. This is a beneficial environmental impact over traditional natural gas-fired power plants and one that is supported by both NEPA's requirement that agencies take a "hard look" at the environmental impacts of their decisions, and the FLPMA, which requires that the BLM take into consideration multiple use policies that include siting renewable energy production on public lands, and these state policies.

Potential environmental impacts from the No Project alternative would result in greater fuel consumption and air pollution because new gas-fired power plants would need to be brought into operation or electricity would need to be generated from older, less efficient plants that have high air emissions. Since solar energy is produced during periods of peak demand, much of the replacement power would be generated by less efficient, more polluting, peaking plants. An analysis of the environmental impacts from the No Project alternative is provided below in Section 6.3.7.

A similar alternative to the No Project alternative is the use of energy conservation as a way to reduce electricity demand. This Conservation Alternative would be to encourage energy users to reduce electricity use, thus reducing demand for electricity and the need for additional power plants. Currently, the State of California and all major utilities offer conservation programs and incentives for customers to conserve energy. In fact, in 2005 California was the second most energy efficient state in the union[1] and, based on 2003 data, energy consumption per capita in California was the lowest of all the states.[2] More Energy Star appliances (clothes washers, refrigerators, dishwashers, and air conditioners) are sold in California than any other state. In 2005, 17 percent of new housing met or exceeded the state's Title 24 energy efficiency building code requirements by at least 15 percent. As a result of energy conservation standards, Californians saved 4 billion kilowatt-hours in 2005.[3] Although there is always room to improve energy conservation, it will not replace the need for additional power plants given the fact that about one-third of all in-state generation is more than 40 years old and that peak electricity demand is growing at about 2.4 percent per year (or about 1,500 MW).[4] In addition, even in the unlikely event that all future load growth were met by conservation, new renewable energy plants would still be required to meet the state renewable energy goals. The Conservation Alternative was not considered for further analysis, since it is a variation of the No Project Alterative and it has the same results (described below) as the No Project Alternative.

If the No Project alternative were selected, the Applicant would not receive authorization to construct and operate a new solar power generation facility. As a result, the proposed facility site would not be developed and would potentially be used for some other development, consistent with BLM's CDCA Plan. The No Project alternative fails to

[1] http://www.fypower.org/about/faq.html

[2] http://www.energy.ca.gov/electricity/us_percapita_electricity_2003.html

[3] http://www.fypower.org/about/faq.html

[4] http://www.cpuc.ca.gov/cfaqs/howhighiscaliforniaselectricitydemandandwheredoesthepowercomefrom.htm

implement the multiple use goals of the FLPMA and the CDCA RMP, which specifically allows for renewable energy production in this area. Energy that would have been produced by the proposed facility would need to be generated by another source and imported to southern California. Common available sources include older power generation facilities that operate less efficiently and release larger quantities of air pollutants and greenhouse gases than the proposed facility, and new thermal power plants.

The purpose of the Ivanpah SEGS is to generate renewable solar power and provide electric power to southern California electrical users. The No Project alternative is not considered feasible because it does not meet the Applicant's goals for the development of new solar power generation facilities to assist California in meeting its renewable power goals, carbon reduction goals, and reducing dependence on imported power.

6.2.3 Comparative Analysis of Sites Carried Forward for Further Analysis

In this section, the potential environmental impacts of the four alternative sites carried forward for further analysis are discussed in comparison to the proposed site. The No Project alternative is also analyzed. Potential environmental impacts from use of the proposed site are presented in more detail in the 16 environmental subsections of Section 5.0 of the Application for Certification (AFC). Table 6.2-3 (located at the end of this section) summarizes the impacts of each alternative site in comparison to the proposed site. Unless otherwise stated, it is assumed that the No Project alternative would not provide the benefits of the project, would not meet the basic project objectives of the Applicant, and would not result in the impacts associated with the project.

6.2.3.1 Air Quality

From an air quality perspective, the plant's configuration and operation would be essentially the same at every location. The type and quantity of air emissions from the alternative sites would be very similar, if not identical. Similarly, the impacts on the human population and the environment would only differ slightly because of the remote location of the sites and the low level of combustion required to augment the project's solar capabilities. The Ivanpah SEGS site, Ivanpah Site A, and Ivanpah Site C are the only locations that have communities within a 5-mile distance (i.e., 4.5 miles away in Primm, Nevada). Local terrain is similar at all sites and not likely to change impacts. All of these sites are in the same air basin and any offsets required by the Mojave Desert Air Quality Management District would be equal for every site. Potential impacts of the project to residents are discussed in Section 5.6, Public Health, and potential impacts on wildlife are discussed in Section 5.2, Biological Resources. It should be noted that air emissions from this 400-MW plant are substantially lower than the emissions from a 400-MW natural gas-fired base load plant.

Without this plant, it is likely that older plants that create substantially more air pollution than the proposed project would remain online or that electricity demand would be served from gas-fired plants. Thus, overall, the air quality would be slightly worse than if the plant were not built.

6.2.3.2 Biological Resources

The proposed and alternative sites are all within the portion of the Mojave Desert that is within San Bernardino County, California. Therefore, it is anticipated that these sites would

have similar biological impacts. Ivanpah Sites A, C, and Broadwell Lake are located within the BLM's Northern and Eastern Mojave (NEMO) Management Plan boundary. The Siberia site is located within the BLM's Northern and Eastern Colorado (NECO) Management Plan boundary. Both these regional plans identify measures to manage the desert tortoise (*Gopherus agassizii*), which is a federal and state listed threatened species.

The Ivanpah Sites A and C are expected to contain similar habitat conditions including topography, alluvial substrate, ephemeral drainages, creosote bush scrub plant community and wildlife to the Ivanpah SEGS site due to their close proximity to one another. A California Natural Diversity Database (CNDDB) search was performed at a 10-mile radius from these alternative sites and the special-status species were very similar to those identified for the proposed site. Ivanpah Sites A and C are located within the range of the desert tortoise and this species is expected to be present at both sites with relative densities being similar to the proposed site. However, the major difference between these two sites is Ivanpah Site C is located within U.S. Fish and Wildlife Service (USFWS) designated critical habitat for the desert tortoise and a BLM-designated DWMA.

The alternative Broadwell Lake and Siberia sites are approximately 80 miles southwest of the proposed site and, therefore, are expected to contain similar habitat conditions including topography, alluvial substrate, ephemeral drainages, creosote bush scrub plant community, and wildlife. A CNDDB search was performed at a 10-mile radius from these alternative sites and revealed several special-status species that were not identified at the proposed site or the Ivanpah Site A and Site C alternatives. These species included crucifixion thorn (*Castela emoryi*), LeConte's thrasher (*Toxostoma lecontei*), Mojave fringe-toed lizard (*Uma scoparia*), and white-margined beardtongue (*Penstemon albomarginatus*), which are not listed as threatened or endangered species.

The Broadwell Lake and Siberia sites are located within the range of the desert tortoise and this species is expected to be present at both sites. However, it is uncertain if the desert tortoise relative densities are similar to the Ivanpah SEGS site. Both of these alternative sites are located outside USFWS-designated critical habitat for the desert tortoise and a BLM-designated DWMA.

With the No Project alternative, the site would remain in the current state and no additional biological impacts would occur. However, the additional power generation that would be required at other locations will likely have biological impacts.

6.2.3.3 Cultural Resources

The proposed site and the four alternative sites have similar potential for cultural impacts. Each site is located in the Mojave Desert and is located sufficiently distant from dry lakes so as to minimize the potential for cultural impacts. Most areas are located on alluvial fans where ground conditions are dominated by heavily disturbed braided ephemeral drainages caused by active erosion from flash flooding and other natural processes. These processes bury or obliterate evidences of archaeological sites. Therefore, cultural resource sensitivity is generally considered low. The sites are also similar in their potential to impact linear historic architectural resources, such as historic electrical transmission lines, roadway alignments, and railroads. While it is possible for these types of historic features to be physically impacted, the effect is typically not considered adverse, because where sites are found to be

considered significant, they are found to be so only under National Register of Historic Places criterion A, for their association with events or broad patterns important in history, and not for their physical attributes. Nonetheless, the proposed and alternative sites all possess equal potential to impact these types of linear historic features. No other historic architectural resources are present.

With the No Project alternative, there would be no impact to archeological or historic resources.

6.2.3.4 Geologic Hazards and Resources

The potential for seismic impacts is low (and would be essentially the same) for the Ivanpah SEGS site and Ivanpah Sites A and C. The Broadwell and Siberia sites, however, are located in areas of known faults that have exhibited late Quaternary displacement. Therefore, the potential impact is moderate. However, seismic impacts at all plant locations can be addressed in plant design.

The No Project alternative would not affect geological hazards or resources.

6.2.3.5 Hazardous Materials Handling

The same quantity of hazardous materials would be stored and used at all locations. The risk of potential impacts is small at each location since the amount of hazardous materials required to be stored and used is much smaller than a thermal power plant of similar output. Also, because the sites are remote, the risk of impact to the public is extremely small.

The No Project alternative would avoid the incremental increase in transportation, use, and storage of hazardous materials during construction and operation of a power plant.

6.2.3.6 Land Use

The proposed site and the four alternative sites are located in the San Bernardino County on land managed by BLM. A summary of the land use designations is provided in Table 6.2-4.

TABLE 6.2-4
Land Use Status of Sites

Site Location	County Designation Zoning	BLM Designation
Ivanpah SEGS site	Resource Conservation	L/M
Ivanpah Site A	Resource Conservation	L/M
Ivanpah Site C	Resource Conservation	L/M
Broadwell Lake	Resource Conservation	M
Siberia	Resource Conservation	M

Multiple use is an objective of the FLPMA and CDCA RMP, which specifically envisions renewable energy development in areas with BLM designations of L and M. The proposed site and the four alternative sites are located in the Mojave Desert. Development at any of the five sites will not remove Prime Farmlands or other important farmlands.

With the No Project alternative, the land uses would remain as they are, and are presumed to be consistent (or to be developed consistent) with existing land use plans and policies. However, the No Project alternative fails to implement the CDCA RMP goals for renewable development.

6.2.3.7 Noise

None of the locations are near sensitive receptors. In addition, a solar power plant (as proposed) does not generate substantial noise. Therefore, no potential impacts from noise are anticipated at any of the alternative locations.

The No Project alternative would not result in further immediate development in these areas and ambient noise levels would likely remain unaffected.

6.2.3.8 Paleontological Resources

All of these sites are located on alluvial fans. All sites are away from playas and dry lakes in the valley bottoms and away from the rocky outcrops of the mountainsides surrounding these intermountain valleys. In doing so, they avoid the high-potential lake silts and fossil springs surrounding the old Ice Age lakes in the valley bottoms, as well as the surrounding hillsides that can be composed of older fossiliferous rocks. Alluvium in most desert environments has low to no paleontological potential, and therefore, siting on alluvial fans assures that in most (but not all) cases they will have little to no potential to affect paleontological resources. Therefore, potential impacts to paleontological resources are not anticipated at any of the sites.

The No Project alternative would not affect paleontological resources.

6.2.3.9 Public Health

Neither the proposed site nor the four alternative sites are located within 1 mile of sensitive receptors such as schools, hospitals, churches, residential areas, or other facilities that would potentially be considered sensitive receptors for public health. In addition, public health impacts are generally related to air quality, which is not expected to result in significant impacts. The sites appear equivalent with respect to potential impacts.

Under the No Project alternative there would be no change to public health.

6.2.3.10 Socioeconomics

The Ivanpah SEGS site and Ivanpah Sites A and C are located less than 50 miles from Las Vegas, Nevada, which will supply most of the construction and operation labor for the project.

The Broadwell Lake and Siberia sites are located almost midway between Las Vegas and the Los Angeles basin. These sites are about 160 to 180 miles from Las Vegas; about 60 miles from Barstow, California; about 100 miles from Victorville, California; and about 130 miles from San Bernardino, California. Thus, the construction workforce would be subject to substantially longer commutes. Also, Barstow—the closest community of any size—may not be able to supply sufficient temporary lodging (e.g., motels and recreational vehicle parks) for construction workers. Although the distances are great, it is unlikely that construction

workers would relocate their families to Barstow; therefore, it is not anticipated that development at Broadwell Lake or Siberia will impact schools.

Development of the project at the Ivanpah SEGS site and Ivanpah Sites A and C would likely result in a substantial amount of materials and supplies coming from Nevada. Development of the project at Broadwell Lake or Siberia could result in more sales taxes to California, and communities located in California, from the purchase of local materials and supplies.

Because they will not have any disproportionately high and adverse human health or environmental effects on minority and low-income populations, given their remote locations and the low potential impacts associated with solar thermal projects, there are no environmental justice issues anticipated at any of the sites.

With the No Project alternative, no economic benefit would be realized within the region of influence.

6.2.3.11 Soils

Development of the proposed site and the four alternative sites would generally affect the same amount of land area, since in all cases about 5.25 square miles would need to be disturbed. However, those sites with longer linear corridors would have slightly more impacts. Thus, Siberia would have the greatest impact, and Broadwell Lake and Ivanpah Site C would have slightly more impacts than the other two sites.

Under the No Project alternative, the areas would remain undeveloped and existing soils would not be affected.

6.2.3.12 Traffic and Transportation

The Ivanpah SEGS site, Ivanpah Site A, and Ivanpah Site C are easily accessible via I-15. The sites are less than 50 miles south of Las Vegas. Regional access to these sites is provided from the south via I-15 and Highway 164 (Joshua Tree Highway, becoming Nipton Road at the California–Nevada border), which traverse through the region in a north-south and east-west direction, respectively. To the north (south of Las Vegas), I-215 and Highway 604 are the closest major facilities that feed into I-15. Local roadways in the vicinity include Yates Well Road and a dirt road named Colosseum Road. The primary traffic concern is that I-15 operates at LOS F on Friday afternoons when traffic from the Los Angeles basin goes to the Las Vegas area.

Both Broadwell Lake and Siberia are accessible from the north and south directions via I-15 to I-40. From I-40, Broadwell Lake is accessed by heading north on Crucero Road. Siberia is accessible from I-40 by heading east on National Trails Highway (also known as Route 66) then taking an unnamed dirt road south. It is anticipated that construction of these sites would be performed by workers from the High Desert, the Los Angeles basin, and Las Vegas. Therefore, construction of a facility at these locations would not result in traffic impacts for those living in California, only for those workers from the Las Vegas area that would be returning home on Friday afternoons.

The No Project alternative would have no impact on traffic.

6.2.3.13 Visual Resources

Typically, the potential for visual resource impacts associated with a site varies depending on the relative visibility of the site from roads and residences, and the length and potential visibility of any new transmission lines that the power plant would require. Visual impacts are also a function of the surrounding facilities.

The nearest public facility to the Ivanpah SEGS site, Ivanpah Site A, and Ivanpah Site C is the Primm Valley Golf Club, located about 0.5 mile to the east of Ivanpah 1. Impacts from the golf course are discussed in Section 5.13, Visual Resources. Ivanpah Site A is farther from the golf course, so impacts would be slightly less; Ivanpah Site C is even farther away, to the south of the golf course and on the other side of I-15. In addition, these sites will be visible from I-15, and the Ivanpah Site C will also be visible from Highway 164. Regardless, visual impacts at these locations are not significant.

Some portion of the top of the towers on the Broadwell Lake site may be visible to traffic on I-40. Similarly, one portion of the Siberia plant would be visible to travelers on the National Trails Highway. There are no other viewers at either of these locations. Therefore, visual impacts would not be significant.

The No Project alternative would avoid visual impacts from the development of a solar power plant and would avoid introducing additional tall structures such as power towers and transmission lines into the area.

6.2.3.14 Waste Management

The same quantity of waste would be generated at the proposed site as at the alternative sites. The environmental impact of waste disposal would not differ significantly between the alternative sites.

The No Project alternative would eliminate the need to dispose of liquid and solid waste from the construction and operation of the solar power plant.

6.2.3.15 Water Resources

Potable and industrial water for the plant at any site would consist solely of groundwater. All sites are outside of the adjudicated basins. Ivanpah Site A and Ivanpah Site C would have identical impacts with regard to water use. Initial examinations of the basins suggest water availability at depth at Broadwell Lake and Siberia, and these sites are expected to be generally equivalent with respect to water use.

The No Project alternative would not require the additional use of groundwater at any site.

6.2.3.16 Worker Health and Safety

Potential impacts on worker health and safety are activity-specific rather than site-specific. Regardless of the location, the Applicant will prepare appropriate health and safety plans to protect workers and reduce the potential for injuries. Therefore, the worker health and safety impacts from all of the alternative sites are equivalent to the proposed site.

Under the No Project alternative, there would be no construction and, therefore, no potential for impacts to workers.

6.3 Selection of the Proposed Site

Table 6.3-1 compares the potential environmental effects of the Ivanpah SEGS site with the other alternatives. As shown in the table, no alternative site would feasibly attain most of the basic objectives of the project while also avoiding or substantially lessening any potentially significant effects of the project. The proposed and alternative sites all appear to be suitable for solar development.

The Ivanpah SEGS site and the alternative sites have similar environmental profiles, given that they all have similar environmental settings; however, Ivanpah SEGS avoids some of the potential issues that the other sites have. The disadvantages of the Siberia site include that the plant would have to be spilt into two sections, located a few miles apart; it is located near historic Route 66; and it would require about 15 miles of new transmission line. The disadvantages of the Broadwell Lake site include that there is a slightly greater potential for paleontological issues since it is located near the dry lake and the Cady Mountains; it would require a new gas supply line about 7 to 8 miles long, and it would require about 7 miles of new transmission line. Both Siberia and Broadwell Lake have the advantage that traffic impacts to I-15 would be less, but that benefit is counterbalanced by the fact that the commute distance for workers is much greater.

The Ivanpah SEGS site and Ivanpah Site A are similar. The major disadvantage of Site A is that the grade is steeper and there would be more impact to soils. Ivanpah Site C is also similar to the Ivanpah SEGS site. However, it has a major disadvantage being in a DWMA; it is located closer to the Ivanpah Dry Lake than the other two sites; and it would need about 6 or 7 miles of new gas line and 3 miles of new transmission line, both of which would have to cross I-15.

Based on the foregoing analyses, the No Project Alternative would have the least potential for significant impacts. However, the No Project Alternative would not meet the basic project objectives and would not provide the benefits of the project. It also fails to implement the multiple use goals of the FLPMA and the renewable energy goals of both the FLPMA and the CDCA RMP. Of the alternatives considered that are potentially capable of meeting the project objectives, the Ivanpah SEGS site, incorporating the mitigation measures proposed in this AFC, would be expected to result in the least short-term and long-term environmental effects.

6.4 Linear Corridors

Linear facilities required for the Ivanpah SEGS project include a natural gas supply line, an electric transmission line, and a water line (see Figure 1.2-3). The proposed linear facilities are presented in Section 2.0, Project Description; Section 3.0, Electric Transmission; Section 4.0, Natural Gas Supply, and Section 5.15, Water Resources. No alternatives to the proposed corridors were considered because the distances are relatively short and direct, and because alternative routes would not avoid or substantially reduce environmental impacts compared to the project.

TABLE 6.3-1
Comparison of the Ivanpah SEGS Site and Alternative Site Locations

Characteristic	Proposed Site	Ivanpah Site A	Ivanpah Site C	Broadwell Lake	Siberia
Size of parcel (parcel must be about 5 sq. miles or larger)	Greater than 5 square miles	Greater than 5 square miles	Greater than 5 square miles	Greater than 5 square miles	Would require 2 separated locations to provide 5 square miles
Parcel grade should be 5% or less.	≤5%	≤5%	≤5%	≤5%	≤5%
Potential presence of threatened and endangered species/habitat	High. Desert Tortoise documented onsite	Medium. Desert Tortoise	High. Located in a Desert Wildlife Management Area	Medium. Desert Tortoise	Medium. Desert Tortoise
Potential cultural/ archaeological sensitivity	Low due to distance from dry lake	Low due to distance from dry lake	Medium due to distance from dry lake	Low due to distance from dry lake	Medium (near historic Route 66)
Appropriate zoning/ Federal Plan Designation	Yes/Federal Land BLM Designation L/M	Yes/Federal Land BLM Designation L/M	Yes/Federal Land BLM Designation L/M	Yes/Federal Land BLM Designation M	Yes/Federal Land BLM Designation M
Proximity to sensitive noise receptors	No	No	No	No	No
Risk to humans from deposition of air pollutants	No	No	No	No	No
Removal of prime agricultural land	No	No	No	No	No
Traffic and transportation	Concern with Friday pm traffic to Las Vegas	Concern with Friday pm traffic to Las Vegas	Concern with Friday pm traffic to Las Vegas	Concern with distance from construction workforce	Concern with distance from construction workforce
Potential visual sensitivity	Low	Low	Medium	Low	Low
Ability to use water consistent with State Water Resources Control Board policy	Only source is groundwater. Usage is very low.	Only source is groundwater. Usage is very low.	Only source is groundwater. Usage is very low.	Only source is groundwater. Usage is very low.	Only source is groundwater. Usage is very low.

TABLE 6.3-1
Comparison of the Ivanpah SEGS Site and Alternative Site Locations

Characteristic	Proposed Site	Ivanpah Site A	Ivanpah Site C	Broadwell Lake	Siberia
Potential paleontological sensitivity	Low	Low	Medium (closer to Ivanpah Dry Lake)	Medium (close to Broadwell Dry Lake and Cady Mountains)	Low
Existing gas supply	0.5 mile to north	2 to 3 miles to the north	6 to 7 miles to the north. Must cross under I-15	7 to 8 miles to the south	~0.5 mile; bisects the two sites
Existing transmission (CAISO)	~0.5 mile; between Ivanpah 1 and 2	~0.5 mile	~3 miles to the north; would have to cross I-15	7 to 9 miles to the northwest (line interconnects at the substation)	~15 miles to the north

6.5 Alternative Project Configurations

The proposed 400-MW project configuration of Ivanpah SEGS is the result of considering a variety of design and operating limitations. The main factors affecting the configuration include available land area, interfering land features, water supply, transmission capacity, and demand for renewable energy. For example, to avoid a limestone outcropping, the Ivanpah 3 arrays were redesigned and shifted to the east. However, smaller-sized projects were also considered but were rejected.

In addition to the proposed 400-MW Ivanpah SEGS, the Applicant considered the development of a smaller plant such as a 100- or 200-MW plant. Generally, a smaller plant would have proportionately smaller impacts. For example, a 100-MW or 200-MW plant would still have air emissions, but they would be proportionately less than the 400-MW plant. A smaller plant would require less land area (about 850 acres for each 100 MWs) resulting in fewer biological impacts. The site does not appear to be culturally or paleontologically sensitive, but a smaller site would have less risk of having cultural or paleontological impacts. Geological impacts would remain the same for a small or large site. Hazardous materials would be needed at small or large sites. The quantities may be proportional, but the risks would be about the same regardless of the size of the site. Land use would be consistent regardless of the site. Public health impacts would be proportionately less at a smaller site, but they are not significant at the larger site. There are no socioeconomic impacts at the larger site and, so, there would not be any with the development of a smaller site; but the benefits (property tax revenues, employment, etc.) would be proportionately less with a smaller site. The potential for soil erosion would be proportionately less at a smaller site as would traffic impacts because the work force would be smaller and of shorter duration. Visual impacts would be less with a smaller project, but any project, regardless of site, would change the visual character of the area and the difference would not be significant as a result of the size of the plant. Waste products would be proportionately less with a smaller site as would water consumption. Worker safety may be slightly lower with a smaller plant because there would be fewer workers and the construction duration would be shorter.

Even if the impacts are proportionally higher, the impacts from the 400-MW Ivanpah SEGS will be mitigated below the level of significance. Hence, a small or large plant would have some environmental impacts, but neither would create significant environmental impacts. In addition, placing a smaller plant on the site would possibly reduce the potential for other sites to be located in that area. Hence, a smaller plant may reduce the possibility of other plants being able to take advantage of the excellent solarity at this location. In addition, California's goals for increased use of renewable power and reduction of carbon sources would not be as well served, including the policy objectives set forth in SB 1078 (California Renewable Portfolio Standard Program) and AB 32 (California Global Warming Solutions Act of 2006). The smaller project would not feasibly accomplish most of the basic objectives of the project and would not avoid or substantially lessen one or more of the significant effects. It would also not further the objectives of FLPMA, which includes renewable energy development, and the objectives of the CDCA RMP, which allows for solar energy development in some areas, including the proposed project area.

6.6 Alternative Technologies

BrightSource was founded to commercialize a cost-effective solar energy technology. A project goal is to produce solar energy using BrightSource's proprietary Distributed Power Tower (DPT) technology. In developing its proprietary technology, BrightSource evaluated other solar technologies including solar trough, Stirling engines, central power tower, and photovoltaics. These alternative technologies are not as cost-effective as the DPT technology.

Other generation technologies considered for Ivanpah SEGS are grouped according to the fuel used:

- Oil and natural gas
- Coal
- Nuclear
- Hydroelectric
- Biomass
- Wind

Alternative technologies were evaluated with respect to commercial availability, implementability, and cost-effectiveness.

6.6.1 Oil; Natural Gas; Coal; Conventional and Supercritical Boiler/Steam Turbine, or Simple Combustion Turbine

These technologies are commercially available and could be implemented. However, because of relatively low efficiency, they emit a greater quantity of air pollutants per kilowatt-hour generated than solar power. Use of these fuel sources does not meet the project objective of being a renewable power source; nor does it meet the objective of using DPT technology; therefore, they were eliminated from consideration.

6.6.2 Nuclear

California law prohibits new nuclear plants until the scientific and engineering feasibility of disposal of high-level radioactive waste has been demonstrated. To date, the CEC is unable to make the findings of disposal feasibility required by law for this alternative to be viable in California. The technology, therefore, is not implementable.

6.6.3 Hydroelectric

Most of the sites for hydroelectric facilities have already been developed in California and any remaining potential sites face lengthy environmental licensing periods. It is doubtful that this technology could be implemented within 3 to 5 years. Use of this fuel source meets the project objective of being a renewable power source; however, it does not meet the objective of using DPT technology. Therefore, it was eliminated from consideration.

6.6.4 Geothermal

Geothermal development is not viable in the Mojave Desert because suitable thermal vents and strata are not present. Therefore, it was eliminated from consideration.

6.6.5 Biomass

Major biomass fuels include forestry and mill wastes, agricultural field crop and food processing waste, and construction and urban wood wastes. Because sufficient biomass fuel is not available in the Mojave Desert, this technology was eliminated from consideration.

6.6.6 Wind Generation

In California, the average wind generation capacity factor has been 25 to 30 percent. Use of this fuel source meets the project objective of being a renewable power source; however, it does not meet the objective of demonstrating the technical and economic viability of the DPT technology. Therefore, it was eliminated from consideration.

6.7 Reference

California Energy Commission. 1995. 1*994 Biennial Electricity Report* (ER94), P300-95-002. November.

TABLE 6.2-3
Impacts of Each Alternative Site Compared to the Ivanpah SEGS Site

Resource	Proposed Site	Ivanpah Site A	Ivanpah Site C	Broadwell Lake	Siberia
Air Quality	Construction emissions and emissions from the plant would be the same at every location. Construction impacts of linears would be in the low range since this site would require short (~0.5 mile) gas and transmission lines (~0.5 mile). Overall, air quality impacts would be expected to be less than significant.	Construction emissions and emissions from the plant would be the same at every location. Construction impacts of linears would be in the low range since this site would require short gas (~0.5 mile) and moderate transmission lines (2-3 miles). Overall, air quality impacts would be expected to be less than significant.	Construction emissions and emissions from the plant would be the same at every location. Construction impacts of linears would be in the high range since this site would require long (6-7 miles) gas and moderate transmission lines (~3 miles). Plus, these linears would have to cross the freeway. Overall, air quality impacts would be expected to be less than significant.	Construction emissions and emissions from the plant would be the same at every location. Construction impacts of linears would be in the high range since this site would require long gas (~7-8 miles) and long transmission lines (7 miles). Overall, air quality impacts would be expected to be less than significant.	Construction emissions and emissions from the plant would be the same at every location. Construction impacts of linears would be in the low range since this site would require short gas (~0.5 mile) and long transmission lines (~15 miles). Overall, air quality impacts would be expected to be less than significant.
Biological Resources	Sources were researched for this site including NEMO, CNDDB, and CNPS. The BLM, CDFG, USACE and USFWS were consulted. This proposed site was surveyed for desert tortoise per USFWS protocol. Based on these sources and surveys, the site is expected to adversely impact this threatened species. With implementation of appropriate mitigation measures and permitting, it is anticipated that potential biological resource impacts could be mitigated below the level of significant.	Sources were researched for this site including NEMO and CNDDB. The BLM biologist was consulted. This alternative site was not surveyed for desert tortoise per USFWS protocol. Based on these sources and its proximity to the proposed site, this alternative site is anticipated to have similar impacts as the proposed site. With implementation of appropriate mitigation measures and permitting, it is anticipated that potential biological resource impacts could be mitigated below the level of significant.	Sources were researched for this site including NEMO and CNDDB. The BLM biologist was consulted. This alternative site was not surveyed for desert tortoise per USFWS protocol. Based on these sources and its proximity to the proposed site, this alternative site is anticipated to have similar impacts as the proposed site. With implementation of appropriate mitigation measures and permitting, it is anticipated that potential biological resource impacts could be mitigated below the level of significant.	Sources were researched for this site including NEMO and CNDDB. The BLM biologist was consulted. This alternative site was not surveyed for desert tortoise per USFWS protocol. Based on these sources and its proximity to the proposed site, this alternative site is anticipated to have similar impacts as the proposed site. With implementation of appropriate mitigation measures and permitting, it is anticipated that potential biological resource impacts could be mitigated below the level of significant.	Sources were researched for this site including NECO and CNDDB. The BLM biologist was consulted. This alternative site was not surveyed for desert tortoise per USFWS protocol. Based on these sources and its proximity to the proposed site, this alternative site is anticipated to have similar impacts as the proposed site. With implementation of appropriate mitigation measures and permitting, it is anticipated that potential biological resource impacts could be mitigated below the level of significant.

TABLE 6.2-3
Impacts of Each Alternative Site Compared to the Ivanpah SEGS Site

Resource	Proposed Site	Ivanpah Site A	Ivanpah Site C	Broadwell Lake	Siberia
Cultural Resources	The plant vicinity has been surveyed Based on these surveys, the location is expected to have low cultural sensitivity. With implementation of appropriate mitigation measures, it is anticipated that potential cultural resource impacts could be mitigated below the level of significance.	The plant vicinity has been surveyed Based on these surveys, the location is expected to have low cultural sensitivity. With implementation of appropriate mitigation measures, it is anticipated that potential cultural resource impacts could be mitigated below the level of significance.	A cultural resource database search has not been performed for this site. However, based on the location of this site and its proximity to the dry lake, this site is anticipated to have moderate cultural sensitivity. With implementation of appropriate mitigation measures, it is anticipated that potential cultural resource impacts could be mitigated below the level of significance.	A cultural resource database search has not been performed for this site. However, based on the location of this site and its distance from the dry lake, this site is anticipated to have low cultural sensitivity. With implementation of appropriate mitigation measures, it is anticipated that potential cultural resource impacts could be mitigated below the level of significance.	A cultural resource database search has not been performed for this site. However, based on the location of this site it is anticipated to have low cultural sensitivity. With implementation of appropriate mitigation measures, it is anticipated that potential cultural resource impacts could be mitigated below the level of significance.
Geologic Hazards	The geologic hazards would be low at this site and can be mitigated by proper engineering.	The geologic hazards would be low at this site and can be mitigated by proper engineering.	The geologic hazards would be low at this site and can be mitigated by proper engineering.	The geologic hazards would be moderate at this site because they are located in areas of known faults that have exhibited late Quaternary displacement. However, they can be mitigated with proper engineering.	The geologic hazards would be moderate at this site because they are located in areas of known faults that have exhibited late Quaternary displacement. However, they can be mitigated with proper engineering.
Hazardous Material Handling	Only small quantities of hazardous materials will be used at the plant and there are no sensitive receptors nearby. Therefore, potential impacts from hazardous materials would be low.	Only small quantities of hazardous materials will be used at the plant and there are no sensitive receptors nearby. Therefore, potential impacts from hazardous materials would be low.	Only small quantities of hazardous materials will be used at the plant and there are no sensitive receptors nearby. Therefore, potential impacts from hazardous materials would be low.	Only small quantities of hazardous materials will be used at the plant and there are no sensitive receptors nearby. Therefore, potential impacts from hazardous materials would be low.	Only small quantities of hazardous materials will be used at the plant and there are no sensitive receptors nearby. Therefore, potential impacts from hazardous materials would be low.
Land Use	Would result in no loss of Prime agricultural land. BLM Designation is L/M	Would result in no loss of Prime agricultural land BLM Designation is L/M	Would result in no loss of Prime agricultural land BLM Designation is L/M	Would result in no loss of Prime agricultural land BLM Designation is M	Would result in no loss of Prime agricultural land BLM Designation is M

TABLE 6.2-3
Impacts of Each Alternative Site Compared to the Ivanpah SEGS Site

Resource	Proposed Site	Ivanpah Site A	Ivanpah Site C	Broadwell Lake	Siberia
Noise	The plant's noise output would be approximately the same at all sites. There are no sensitive noise receptors near the site.	The plant's noise output would be approximately the same at all sites. There are no sensitive noise receptors near the site.	The plant's noise output would be approximately the same at all sites. There are no sensitive noise receptors near the site.	The plant's noise output would be approximately the same at all sites. There are no sensitive noise receptors near the site.	The plant's noise output would be approximately the same at all sites. There are no sensitive noise receptors near the site.
Paleontological Resources	Paleontological sensitivity is low.	Paleontological sensitivity is low	Paleontological sensitivity is medium since the site is closer to the dry lake.	Paleontological sensitivity is medium since the site is closer to the dry lake.	Paleontological sensitivity is low.
Public Health	The impacts are directly related to air quality impacts described above, and there are no sensitive receptors. Impacts are considered to be less than to be significant.	The impacts are directly related to air quality impacts described above, and there are no sensitive receptors. Impacts are considered to be less than to be significant.	The impacts are directly related to air quality impacts described above, and there are no sensitive receptors. Impacts are considered to be less than to be significant.	The impacts are directly related to air quality impacts described above, and there are no sensitive receptors. Impacts are considered to be less than to be significant.	The impacts are directly related to air quality impacts described above, and there are no sensitive receptors. Impacts are considered to be less than to be significant.
Socioeconomics	No potential impact to schools and public services is anticipated at any location. Construction workforce would come mostly from Las Vegas, so travel would be reasonable.	No potential impact to schools and public services is anticipated at any location. Construction workforce would come mostly from Las Vegas, so travel would be reasonable.	No potential impact to schools and public services is anticipated at any location. Construction workforce would come mostly from Las Vegas, so travel would be reasonable.	No potential impact to schools and public services is anticipated at any location. Construction workforce would be split between the High Desert, Las Vegas and Los Angeles basin, so travel would be difficult. Local housing facilities may be insufficient.	No potential impact to schools and public services is anticipated at any location. Construction workforce would be split between the High Desert, Las Vegas and Los Angeles basin, so travel would be difficult. Local housing facilities may be insufficient.
Soils	Erosion potential would be about the same at each site. BMPs would be needed to reduce impacts below the level of significance.	Erosion potential would be about the same at each site. BMPs would be needed to reduce impacts below the level of significance.	Erosion potential would be about the same at each site. BMPs would be needed to reduce impacts below the level of significance.	Erosion potential would be about the same at each site. BMPs would be needed to reduce impacts below the level of significance.	Erosion potential would be about the same at each site. BMPs would be needed to reduce impacts below the level of significance.
Traffic and Transportation	Freeway access is good. Potential impact to I-15 during Friday pm commute.	Freeway access is good. Potential impact to I-15 during Friday pm commute.	Freeway access is good. Potential impact to I-15 during Friday pm commute.	Freeway access is good. Potential impact by portion of the workforce using E/B I-15 during Friday pm commute. Long commute times for construction workers.	Freeway access is good. Potential impact by portion of the workforce using E/B I-15 during Friday pm commute. Long commute times for construction workers.

TABLE 6.2-3
Impacts of Each Alternative Site Compared to the Ivanpah SEGS Site

Resource	Proposed Site	Ivanpah Site A	Ivanpah Site C	Broadwell Lake	Siberia
Visual Resources	The plant would be visible from I-15 and the golf course. Visual impacts would not be significant.	The plant would be visible from I-15 and the golf course. Visual impacts would not be significant.	The plant would be visible from I-15, Hwy 164 and the golf course. Visual impacts would not be significant.	A few elements of the plant might be visible from I-40. Visual impacts would not be significant.	The plant would be visible from Route 66. Visual impacts would not be significant.
Waste Management	Waste generated during construction and operations would be about the same at any location.	Waste generated during construction and operations would be about the same at any location.	Waste generated during construction and operations would be about the same at any location.	Waste generated during construction and operations would be about the same at any location.	Waste generated during construction and operations would be about the same at any location.
Water Resources	Groundwater would be required at all sites. Water consumption would be about the same at all sites. Ivanpah basin has ample recharge.	Groundwater would be required at all sites. Water consumption would be about the same at all sites. Ivanpah basin has ample recharge.	Groundwater would be required at all sites. Water consumption would be about the same at all sites. Ivanpah basin has ample recharge.	Groundwater would be required at all sites. Water consumption would be about the same at all sites. Groundwater appears to be available at depth; less is known about recharge.	Groundwater would be required at all sites. Water consumption would be about the same at all sites. Groundwater appears to be available at depth; less is known about recharge.
Worker Health and Safety	Same worker health and safety plans would be implemented at each site.	Same worker health and safety plans would be implemented at each site.	Same worker health and safety plans would be implemented at each site.	Same worker health and safety plans would be implemented at each site.	Same worker health and safety plans would be implemented at each site.

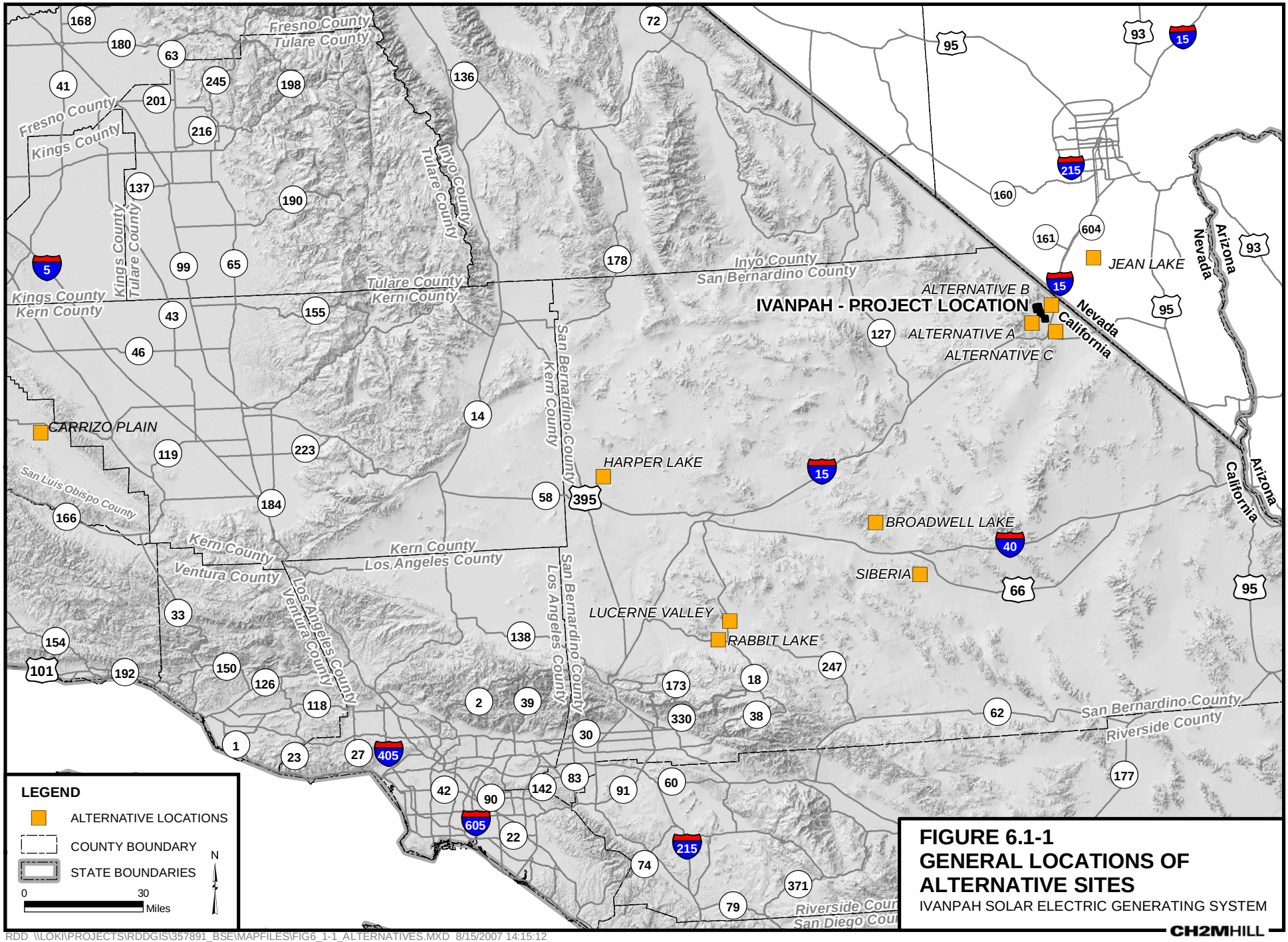

FIGURE 6.1-1
GENERAL LOCATIONS OF ALTERNATIVE SITES
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

CH2MHILL

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